00-PPMI-119

Human Space Flight Program Management Council

Human Space Life Sciences Programs Office

Space Medicine
Biomedical Research and Countermeasures
Advanced Human Support Technology

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Summary of Cost, Schedule, and Technical (OLMSA Activities)

Program	FY 2000 1st Q	2nd Q	3rd Q	4th Q	Impact/Issues
SMR					
Cost	G	G			No Impacts or Issues
Schedule	G	G			No Impacts or Issues
Technical	Y	Y			Resistive Exercise Device
BRC					
Cost	Y	G			No Impacts or Issues
Schedule	Y	G			No Impacts or Issues
Technical	G	Y			Mars 01 Radiation Instrument
AHST					
Cost	G	G			No Impacts or Issues
Schedule	Y	Y			- Miniature Mass Spec Flight Opportunity - IMMWPS Flight Manifest Issue (STS-107)
Technical	G	G			No Impacts or Issues

Cost
Green (G) = 0% to 5% underrun
Yellow (Y) = 0% to 5% overrun
Red (R) = Greater than 5% overrun

Schedule
G = 0% to 5% ahead of baseline
Y = Less than or equal to 5% behind
R = Greater than 5% behind

Technical
G = Meets technical requirements
Y = Does not meet tech rqmts or limits but has approved recovery plan
R = Does not meet tech rqmts or limits and does not have approved recovery plan

HEDS FY 2000 Performance Target Status

Target #	Target	Assessment (R/Y/G)	Progress/Accomplishments
Space Medicine Research			
OH26	ISS Crew Health Care System Checkout	Y	iRED February action
Biomedical Research and Countermeasures Program			
OH33	Mars 01 Radiation Instrument	Y	Delivery Schedule to Lockheed Martin by May 2000
OH1	Investigations Target of 189	G	
OH9	STS-95 Mission Data	G	
OH20	HRF Preparations for ISS	G	
OH25	3 Countermeasures Protocols	G	
OH56	NSBRI Conduct of Symposium	G	
Advanced Human Support Technology Program			
OH36	Strategy to Support Future Human Exploration	G	
OH1	Investigations Target of 77	G	
OH31	BIO-Plex 1st Phase Completion and Key Technology	Y	- IMMWPS Flight Opportunity - Mini Mass Spec Flight Opportunity
OH47	Establish Environmental Center	G	

HEDS FY 2000 Performance Target Status

Space Medicine

- ISS Resistive Exercise Device:
  - Review of the iRED life cycle testing was held on March 31
  - Performance of end-to-end human-in-the-loop testing will occur on the flight equipment post its delivery on July 10, 2000
  - Contingency system has been approved in CHeCS

Biomedical Research and Countermeasures

- Mars 01 radiation experiment (MARIE) development and certification schedule
  - Orbiter instrument testing is ongoing, with a planned turnover to LM end of May
  - The 2001 lander mission has been deleted, assessing flying the 2001 lander in 2003, decision still pending

Advanced Human Support Technology

- BIO-Plex on schedule for operational readiness review in 2002 – requires Bioastronautics augmentation
  - Without the augmentation, advanced life support technology will be significantly reduced
- Miniature Mass Spectrometer flight test, part of an EVA tool, Trace Gas Analyzer. Proposed prototype for 5A, with flight units planned for later flights
- Immobilized Microbe Microgravity Water Processing System (IMMWPS) flight test is not presently manifested
  - Presently below the line for STS-107 payloads manifest list
  - Candidate for R2 mission

Action From HSFPMC

- **Action description**
  - Review of solutions to the International Space Station resistive exercise device mechanical issues (target by the end of March)
- **Response**
  - Hardware review held on March 31
  - Presented iRED system status to Center Director in April
  - Hardware component testing on track for a July 10 delivery
  - End-to-end human-in-the-loop testing planned to commence in July upon receipt of final flight configuration
- **Recommendation**
  - Remain open until testing is complete

Accomplishments Through April

- The Mars MARIE equipment technical issues appear to be resolved and on schedule to be delivered to Lockheed Martin, Denver, by end of May for integration into the orbiter
- Completed MEIT testing on the Human Research Facility rack, completed phase 3 safety review for Increment 3, and completed the informed consent briefings for the Increment 3 Commander
- Completed the crew informed consent briefings for 10 candidate astronaut crewmembers for STS-107
- Completed the first Investigators Working group meeting for the STS-107 flight.
- Wireless Augmented Reality Prototype (WARP) patented, licensed and being utilized by academic institutions
- BIO-Plex facility utilities outfitting proceeding on schedule
- The Environmental Systems Commercial Space Technology Center Cooperative Agreement Notice was released on March 31, 2000, and proposals are due June 1, 2000
- In collaboration with the Naval Experimental Diving Unit (NEDU), a test of the ISS Human Research Facility ultrasound unit was conducted to determine efficacy in visualization of evolved gas bubbles during surfacing from simulated dives. Goal is to determine the potential use in diagnosing decompression sickness.
- Medical scenarios that may require the use of the CHeCS Respiratory Support Pack were successfully tested

FY00 Open Work

- Submitted program plans (BRC and AHST) to the System Management Office for baselining and signature
- Transition planning continues for Bioastronautics initiative start in FY01

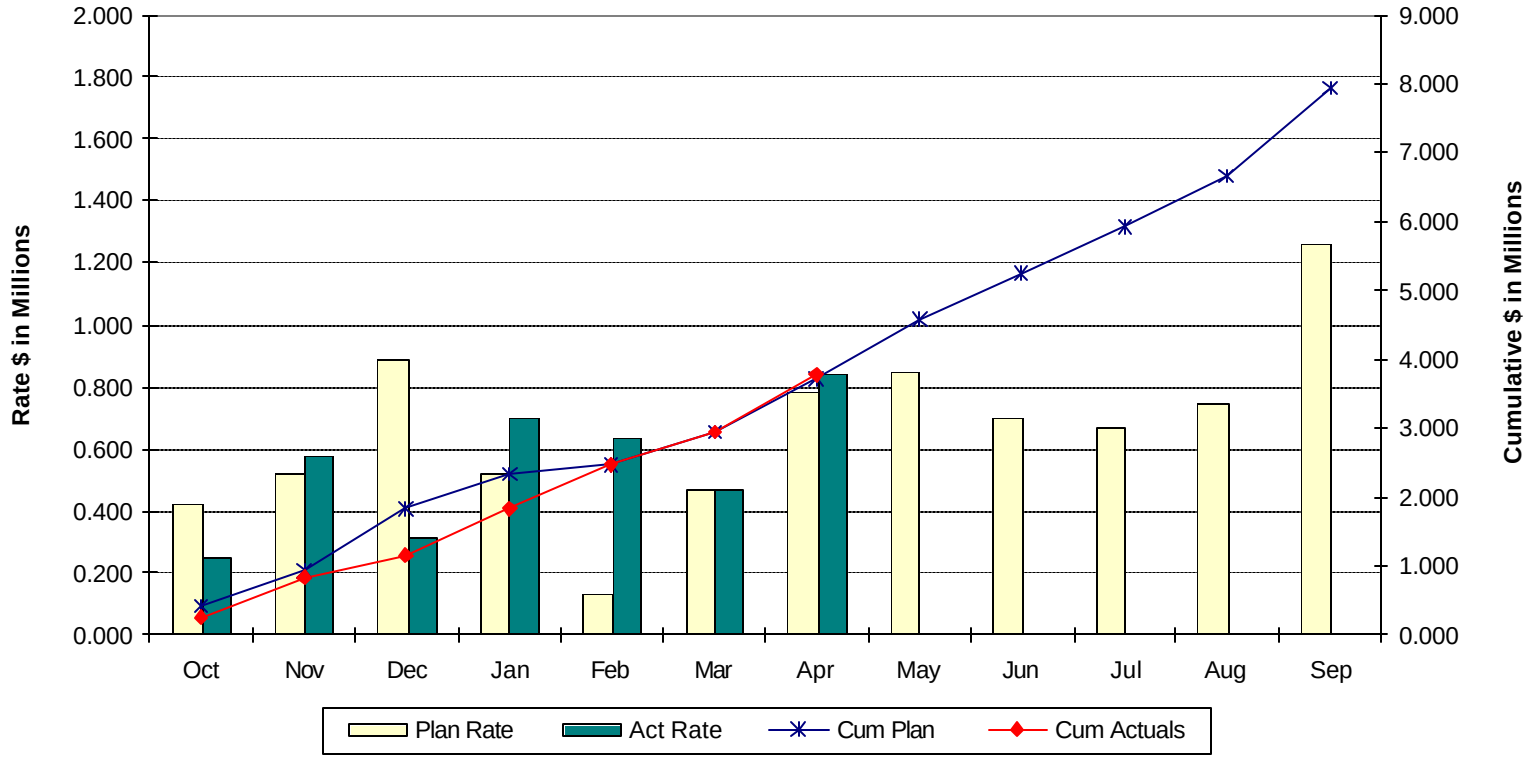
BACK-UP SLIDES

Space Medicine Research
HEDS FY 2000 Performance Target Status

Target #	Target	Assessment (R/Y/G)	Progress/Accomplishments
OH26	ISS Crew Health Care System (CHeCS)		
	Develop medical protocols and test the capability of the Crew Health Care System as integrated in the ISS U.S. Laboratory	G	Ultrasound devices were tested using Experimental Diving Unit (NEDU) divers to determine the efficacy of use in visualization of evolved gas bubbles during surfacing from simulated dives. Data from this study will be used to determine the potential use of ultrasound in diagnosing decompression sickness Medical scenarios that may require the use of the CheCS Respiratory Support Pack were tested Completed microgravity testing of IV air elimination filters (part of the IV Fluids System) on the KC-135 in April

Space Medicine Research

FY00 Operating Plan Status Through April 2000



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan Rate	0.418	0.517	0.892	0.523	0.127	0.467	0.781	0.845	0.697	0.666	0.744	1.259
Act Rate	0.248	0.579	0.315	0.699	0.636	0.467	0.840					
Cum Plan	0.418	0.935	1.827	2.350	2.477	2.944	3.725	4.570	5.267	5.933	6.677	7.936
Cum Actuals	0.248	0.827	1.142	1.841	2.477	2.944	3.784					
Delta	-0.170	-0.108	-0.685	-0.509	0.000	0.000	0.059					

Biomedical Research and Countermeasures
HEDS FY 2000 Performance Target Status

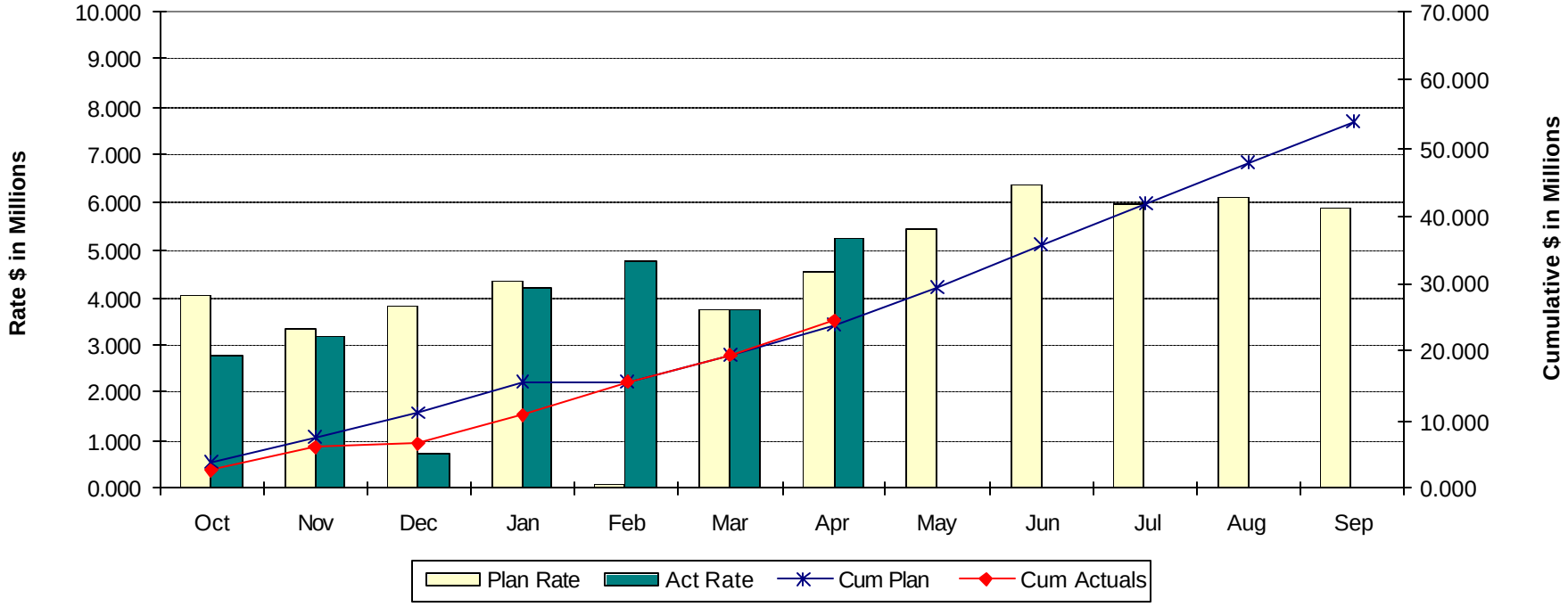
Target #	Target	Assessment (R/Y/G)	Progress/Accomplishments
OH33	**Mars 01 Radiation Instrument**		
	Complete the Radiation Research Instrument for the Mars 01 mission to study transit, orbital, and surface radiation effects and conduct three workshops to define and prioritize research tasks in subjects such as radiation shielding materials, in situ resolution utilization, and fluids management and heat transfer technology. Complete the science definition of granular flows, flight and dust management experiments to begin gathering research data to alleviate critical problems of dust buildup, habitat foundation engineering, and rover performing during planetary exploration.	Y	The Lander for the 01 mission has been canceled and plans are pending on what parts of the 01 mission will be merged with the 03 mission. The MARIE equipment is scheduled to be delivered to Lockheed by May 2000. Four experiments have been selected for the 03 mission.
OH1	**Investigations Target of 189**		
	Support an expanded research program of approximately 935 investigations, an increase of ~17% over FY99. Publish 100% of science research progress in the annual OLMSA Life Sciences & Microgravity Research Program Task Bibliographies and make this available on the Internet.	G	The BRC PI metric was presented to Headquarters on March 17th and May 2nd in support of the review and selection of new grants from the BRC NRA, 99-HEDS-03 call. As of April 2000 the BRC program has 189 active investigations. Note that this is a total number of people working on research projects, of which, 160 are receiving FY00 funding. Clarification on the interpretation of the PI metric policy is on-going to help resolve the concern that there are more research activities on-going that do not receive current year funding. The Life Sciences Program Tasks and Bibliography for FY99 has been completed and placed on the Web in March 2000 (http://peer1.idi.usra.edu). The information will also been compiled and released on both as a CD and hardcopy (released April 2000).
OH9	**STS-95 Mission Data**		
	Complete data reduction from the STS-95 Research Module mission. Begin to explore new cooperative efforts with NIH in the area of aging and transfer space-derived research data for industry development of a new drug to treat Chagas' disease.	G	The research data has been analyzed and a press briefing was completed at NASA HQ in January 2000. Funding has been identified to continue a study entitled "Age-Associated Differences in Postural Equilibrium Control: Implications for Space Flight." This is a joint NASA/National Institute of aging (NIA) effort being conducted at the Baltimore Longitudinal Study on Aging (BLSA), Johns Hopkins Bayview Medical Center, Baltimore. This is a ground-based control study designed to: 1) improve interpretation of STS-95 data and 2) expand the repertoire of objective measures performed at BLSA to include sensory-motor control of balance.

Biomedical Research and Countermeasures
HEDS FY 2000 Performance Target Status

Target #	Target	Assessment (R/Y/G)	Progress/Accomplishments
OH20	**HRF Preparations for ISS**		
	Complete preparations for the initial ISS research capability through the integration of the first rack of the Human Research Facility (HRF-1), five EXPRESS racks with small payload research, and the Microgravity Science Glovebox.	G	Completed Human Research Facility MEIT activites, Phase 3 safety review for increment 3, and completed the informed consent briefings for the Increment 3 Commander.
OH25	**3 Countermeasures Protocols**		
	Evaluate and develop for flight testing a minimum of three major research protocols intended to protect bone, muscle, and physical work capacity and prepare a minimum of 10 biomedical research experiments (utilizing the capabilities of the STS and ISS HRF) to study human responses to the gravitational environment.	G	Completed three flight experiment design reviews. Completed the crew informed consent briefings for 10 candidate astronaut crewmembers for STS-107 and supported the first Investigators Working group meeting for this flight. Initiate contracts / development phase EDs for approved experiments. Baselined JSC 28775 (Solicitation, Evaluation, and Selection of Operational Medicine and Candidate Countermeasure Proposals). Non-Advocate Review Process document obtained SA concurrence and was approved by Code U in April 2000. Midodrine SMO revised to omit Jobst stockings and will be presented to the Medical Sciences Division Configuration Control Board on May 17 for final approval. The iRED in-flight test proposal is completed, and exercise testing of the iRED will begin in July 2000.
OH56	**NSBRI Conduct of Symposium**		
	The NASA-sponsored National Space Biomedical Research Institute (NSBRI) will conduct an open symposium relaying the results of space-oriented research activities focusing on up to 10 ground-related applications with the participation of interested investigators, and publish the results in a conference proceedings report.	G	Ths NSBRI will hold a splinter workshop at the Univeristy of Arkansas related to the biomedical challenges of a mission to Mars, June 3-7, 2000. A workshop report will be generated.

Biomedical Research and Countermeasures

FY00 Operating Plan Status Through April 2000



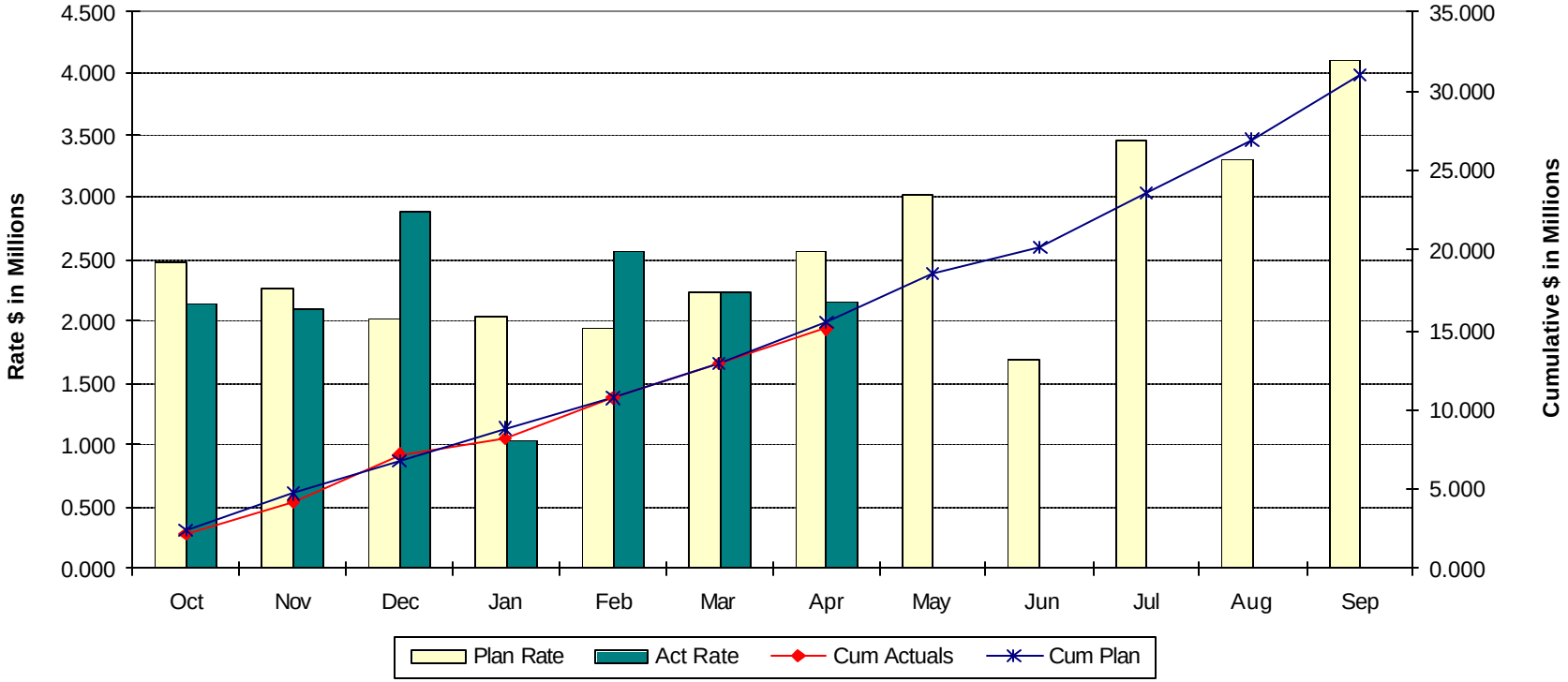
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan Rate	4.047	3.359	3.820	4.331	0.070	3.752	4.556	5.451	6.358	5.987	6.087	5.867
Act Rate	2.770	3.186	0.721	4.190	4.760	3.752	5.224					
Cum Plan	4.047	7.406	11.226	15.557	15.627	19.379	23.935	29.386	35.744	41.731	47.818	53.685
Cum Actuals	2.770	5.956	6.677	10.867	15.627	19.379	24.603					
Delta	-1.277	-1.450	-4.549	-4.690	0.000	0.000	0.668					

Advanced Human Support Technology
HEDS FY 2000 Performance Target Status

Target #	Target	Assessment (R/Y/G)	Progress/Accomplishments
OH36	**Strategy to Support Future Human Exploration**		
	Complete the development and initiate the implementation of a comprehensive technology investment strategy to support future human exploration that includes capability development for increasing self-sustainability, decreasing transit times, developing commercial opportunities, reducing cost, risk, and increasing knowledge and operational safety.	G	Wireless Augmented Reality Prototype (WARP) patented and purchased by Loma Linda University.
OH1	**Investigations Target of 77**		
	Support an expanded research program of approximately 935 investigations, an increase of ~17% over FY99. Publish 100% of science research progress in the annual OLMSA Life Sciences & Microgravity Research Program Task Bibliographies and make this available on the Internet.	G	AHST program met PI targets. All projects are in the task book.
OH31	**BIO-Plex 1st Phase Completion and Key Technology**		
	Complete the first phase (including outfitting three test chambers) of the Advanced Life Support System Integration Testbed facility, which will provide the capability to conduct a series of long-duration, human-in-the-loop advanced technology tests over the next 6 years.	G	BIO-Plex facility utilities outfitting proceeding on schedule.
	Demonstrate key technology capabilities for human support, such as advanced techniques for water processing using microbes, waste processing using biological degradation and fluidized bed incineration,	Y	Inoculation of integrated Biological Water Processor ground test system in progress. Flight Opportunity for IMMWPS still not manifested.
	a non-expendable trace gas contaminant control system, solid waste processing, and the flight test of a miniature mass spectrometer.	Y	Trace Gas Analyzer in final build but flight slipped to FY01.
OH47	**Establish Environmental Center**		
	Establish up to two new Commercial Space Centers.	G	Environmental Systems CSTC CAN released on March 31; proposals due June 1. Food Technology Commercial Center fully functional.

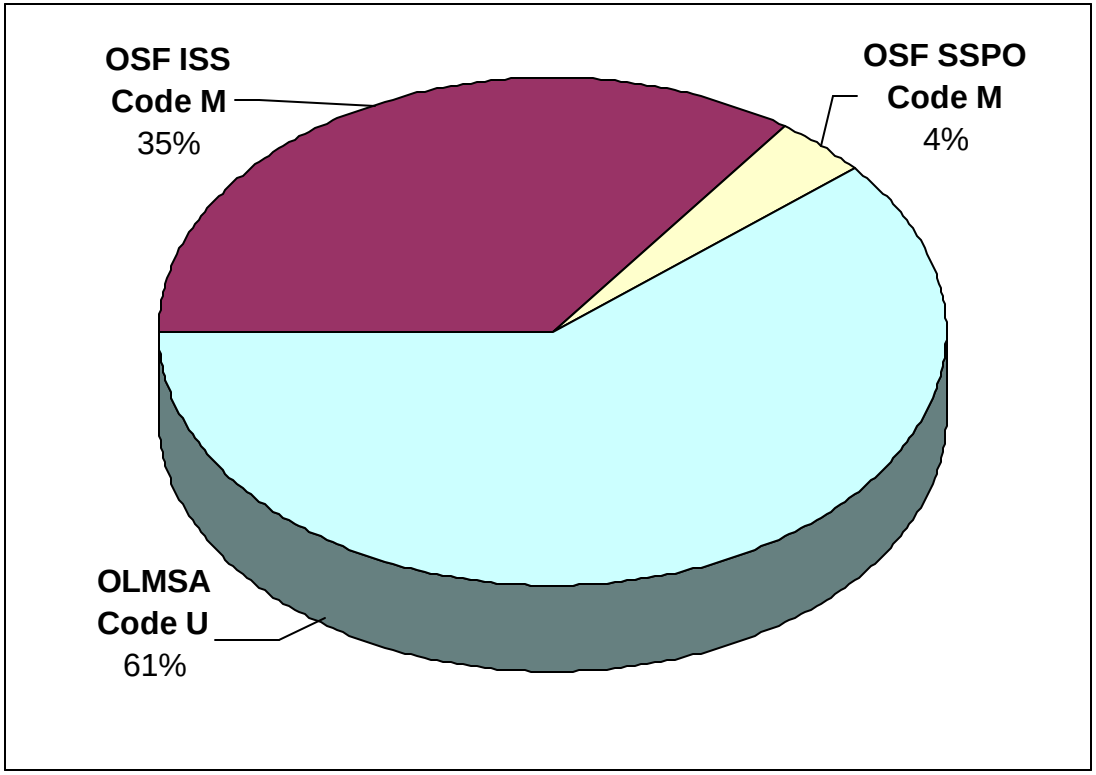
Advanced Human Support Technology

FY00 Operating Plan Status Through April 2000



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan Rate	2.480	2.270	2.012	2.031	1.931	2.233	2.557	3.016	1.684	3.460	3.308	4.108
Act Rate	2.127	2.103	2.892	1.036	2.566	2.233	2.152					
Cum Plan	2.480	4.750	6.762	8.793	10.724	12.957	15.514	18.530	20.214	23.674	26.982	31.090
Cum Actuals	2.127	4.230	7.122	8.158	10.724	12.957	15.109					
Delta	-0.353	-0.520	0.360	-0.635	0.000	0.000	-0.405					

FY 2000 Total Budget
OLMSA and OSF (NOA $M)



($M)

CODE M	
SMR	28.6
BRC	29.4
AHST	1.6
Total	59.6

($M)

CODE U	NOA
SMR	7.0
BRC	48.2
AHST	29.0
Total	84.2

($M)

Total Budget	
OLMSA Code U	84.2
OSF ISS Code M	53.0
OSF SSPO Code M	6.6
Total	143.8

Cumulative Obligations Through April 2000 By Program ($M)

Program	Plan	Actual	Delta
Total	56.1	42.1	-14.0
SMR	5.2	5.0	-0.2
BRC	28.6	21.0	-7.7
AHST	22.3	16.2	-6.1

FY2000 OLMSA CODE U/M Obligations
Variance Explanations Through April 2000

SMR: -$0.240M

- GSFC underrun is due to slower than expected funding Wright State University (-$0.188M) / No corrective action required.
- JSC underrun is due to slower than expected funding of CCCDP Krug (-$0.075M). Contract will be funded to guideline / No corrective action required.

BRC: -$7.661M

- ARC underrun is due to a planning oversight in the rephased plan. ARC used the TAO instead of a phased plan for NOA obligations in their submit to JSC (-$0.565M) / No corrective action required.
- HQS underrun is due to the BAF credit as a result of the CoF conversion (-$3.087M) / No corrective action required.
- JSC underrun is due to the late funding of NSBRI (-$1.928M) / $4.0M PR in process; Flight Experiments (-$1.541) / No corrective action required; Beamtime (-$0.648) / Budget reduction to $0M / No corrective action required.

AHST: -$6.092M

- ARC underrun is due to the late funding of NRAs, SBIR (delayed one month due to an audit), and university grant (-$1.951M) / No corrective action required.
- JSC underrun is due to the late funding of NRAs (-$2.370M) / No corrective action required.
- JPL delay in funding Task Orders by JPL NMO (-$1.220M) / No corrective action required.

FY2000 OLMSA CODE U/M Cost Performance
Status Through April 2000 ($M)

	Cumulative Cost Through Apr '00			FY 2000 EOY ESTIMATE				
Program	Plan	Actual	Delta	TAC	Plan Cost	Projected Cost	Projected Carry-out	Projected C/O % of TAC
Total	72.355	76.820	4.465	187.932	152.309	152.309	35.623	19%
Code U	43.174	43.496	0.322	128.334	92.711	92.711	35.623	28%
Code M	29.181	33.324	4.143	59.598	59.598	59.598	0.000	0%
SMR	19.106	22.703	3.597	37.477	36.516	36.516	0.961	3%
Code U	3.725	3.784	0.059	8.897	7.936	7.936	0.961	11%
Code M	15.381	18.919	3.538	28.580	28.580	28.580	0.000	0%
BRC	37.685	38.303	0.618	109.624	83.074	83.074	26.550	24%
Code U	23.935	24.603	0.668	80.235	53.685	53.685	26.550	33%
Code M	13.750	13.700	-0.050	29.389	29.389	29.389	0.000	0%
AHST	15.564	15.814	0.250	40.831	32.719	32.719	8.112	20%
Code U	15.514	15.109	-0.405	39.202	31.090	31.090	8.112	21%
Code M	0.050	0.705	0.655	1.629	1.629	1.629	0.000	0%

FY2000 OLMSA CODE U/M Cost Performance Variance Explanations Through April 2000

SMR: $0.059M

- No significant variance.

BRC: $0.668

- JSC overrun is due to the costing of grants($0.330M) / No corrective action required; Research Studies - Futron ($0.444M) / Is offset by 396-20 funding making the overrun about $100K / No corrective action required; Brookhaven ($0.042M) / No corrective action required.
- GSFC overrun is due to the costing of NRAs ($0.047M) / No corrective action required.

AHST: -$0.405

- Underrun is due to the slow costing of NRAs (-$0.405M) at JSC and ARC / No corrective action required.

Space Medicine Research

Accomplishments Through April

- An analysis of ISS medical scenarios using CHeCS hardware was initiated. The Respiratory Support Pack (RSP), a part of the Health Maintenance System, was evaluated. Upgrades to the RSP will be recommended.
- In collaboration with the NEDU, a test of the ISS HRF Ultrasound unit was conducted to determine efficacy in decompression bubble detection.
- Historic and new astronaut medical data continues to be entered into the Longitudinal Study of Astronaut Health (LSAH) database.
- A report on the cancer morbidity rates between astronauts, comparison participants and the U.S. population was completed.
- Audiogram data were prepared in support of the Hearing Conservation Program. Custom molded ear plugs were manifested on upcoming Shuttle missions.
- Work began on the development of the Space Flight Fatigue Assessment tool. This software will be used in flight for crewmembers to perform self-assessments relative to their performance.
- Preparations continued for participation in the U.S. Navy “Strong Angel“ Project. A project plan was completed and potential space medical diagnostic equipment was selected to be tested during the Project.

Space Medicine Research

Accomplishments Through April (Continued)

- Completed preparations for the NASA Medical Operations display and for multiple presentations at the annual meeting of the Aerospace Medical Association.
- Integrated Radiation Protection Program
  - Submitted papers, “Initial G2-Chromosome Damage Induced in Normal Human Fibroblasts by High-LET Particles” and “Investigation of the Kinetics in DSB Rejoining and Formation of Simple Chromosome Exchange Aberrations,” to International Journal of Radiation Biology for Publication and “Comparison of F Ratios for High- and Low-LET Radiation” submitted to Radiation Research.
  - Biodosimetry samples from 2 STS-103 crewmembers were analyzed.
  - LPI Workshop on the results of the EMU and Orlan spacesuits performed at Loma Linda University.
  - Performed analysis of radiation exposures and incidence of cancer (premalignant and malignant) and cataracts using LSAH data.
  - Completed radiation MORD and submitted to MMOP.
- Toxicology
  - Prepared the Spacecraft Water Exposure Guidelines for benzothiazoles and methylene chloride.

Space Medicine Research

Accomplishments Through April (Code M)

- Mission Support
  - Completed the verification-2 process for the STS-101 hazardous materials summary table.
  - Completed the ISS Interim Medical Kit checklist.
  - Completed the new flight rule for 6.5 hour maximum EVA duration.
  - Supported three to four ISS simulation activities per week.
  - Completed the redesign of the Shuttle Orbiter Medical System.
- Outreach
  - Completed the Aerospace Medicine Clerkship Program; students from around the world participated in the biannual month-long session.

Biomedical Research & Countermeasures

- Participated in final selection of new ground and flight research proposals for the BRC NRA, 99-HEDS-03.
- Supported the International Life Science Working Group meeting which was held in Germany week of April 24.
- Completed the crew informed consent briefings for 10 candidate astronaut crewmembers for STS-107 and supported the first Investigators Working group meeting for this flight.
- Completed Human Research Facility MEIT activities, Phase 3 safety review for increment 3, and completed the informed consent briefings for the Increment 3 Commander.
- Continuing discussions with ESA and medical operations personnel regarding the Baseline Data Collection roles and responsibilities in Russia.
- Finalized plans for the meeting entitled, “Modeling of Radiation Risk Factors,” scheduled to be held November 13-15, 2000 (Houston). A brochure has been released.
- EMU/Orlan tests at Loma Linda University has been completed which has provide important data for improving EVA safety.
- Baselined JSC 28775 (Solicitation, Evaluation, and Selection of Operational Medicine and Candidate Countermeasure Proposals).
- Non-Advocate Review Process document obtained SA concurrence and was approved by Code U in April 2000.
- Midodrine SMO revised to omit Jobst stockings, it will be presented to the Medical Sciences Division Configuration Control Board review on May 17 for final approval.
- Evaluation of the Tesch Flywheel design was completed in March at JSC, and the evaluation report which will contain experimental data and results will be completed before the end of FY00.
- Human Research Multilateral Review Board reviewed the ISS Data Sharing Agreement on April 10. The HRMRB approved the agreement but directed that it should be reviewed by the Multilateral Medical Operations Panel for endorsement. This was completed, and there is an open action to prepare a white paper that will outline the process for the review and approval for international research.
- IRB approved in April, approaching the U.S. crewmembers of the NASA-Mir Program for consent for using their medical data for countermeasure research activities.
- Issued partial funding for a Biomedical Symposium to be held at the University of Arkansas related to the biomedical challenges of mission to Mars, June 3-7, 2000.

Advanced Human Support Technology

Accomplishments Through April

- AHST Flight Program
  - Bioastronautics Technology rack requirements defined
- ALS
  - Continued BIO-Plex mechanical and electrical outfitting, focusing on power, ventilation, and lighting. Initiated flooring installation.
  - Released CAN for Environmental Systems CSTC on March 31. Proposals due June 1.
  - IMMWPS Flight Hardware continued in final assembly. Functional testing of first flight unit revealed several hardware discrepancies. Resolution in progress. Second unit completion on hold.
  - Conducted Solid Waste Processing Workshop on April 4-6.
- SHFE
  - Initiated Malleable Human-Machine Interfaces for Long-Duration Space Flight project.
  - Negotiated ARC support on WARP project, including human factors analysis and physiological sensors provisioning.
  - Defined a basic scenario for evaluating and demonstrating the feasibility of WARP in a simulated space operational task.
- AEMC
  - Miniature Quadrapole Mass Spectrometer (Trace Gas Analyzer) testing for flight.
  - Investigators Workshop in review by the Science and Technology Working Group; was held in Pasadena, CA, April 17-19.

FY 2000 Issues and Concerns

Space Medicine

- Funding needed to to convert the CMIS to support Systematic Nomenclature of Medicine
  - Provides an interface engine for various databases within NASA and with our international partners
  - Utilizes the international multiaxial encoding system, Systematic Nomenclature of Medicine
  - Establishes a "Virtual Private Network"

Biomedical Research and Countermeasures

Need agreement for Russian/IP participation in CEVP prior to Increments 2, 3, 4 briefing (May)

- Review by the HRMRB and MMOP completed and open action being worked.

- Reliability issues with current iRED design may not be resolved prior to ISS 2A.2b
  - Change request to CHeCS specification for contingency bungee exercise requirements was approved.
  - An end-to-end human-in-the-loop study has been designed and will begin July 2000 when the flight hardware arrives.
- Delays in receipt of CEVP deliverables outlined in MSIC Contract (e.g., identification of success criteria for ITR tests)
  - Corrective Action Plan is being prepared.
- Funding for the BRC NRA, 99-HEDS-03
  - Minimized the number of new selections
  - Lien is being addressed during the POP 2000 activities.
- Loma Linda University program continues "out of phase"
  - This is being addressed during the POP 2000 activities.

Advanced Human Support Technology

- IMMWPS has not received flight manifest. Below line on STS-107 and slipped from 1 to 3 below line in priority.